



Bureau of Safety and Environmental Enforcement

BSEE Seminar: Offshore Oil and Gas Production and Development Permitting Issues

March 27, 2019
BSEE Gulf of Mexico Region

“To promote safety, protect the environment and conserve resources offshore through vigorous regulatory oversight and enforcement.”

Agenda

9:00 - 9:30

INTRODUCTION and WELCOME

RICHIE BAUD, PD Regional Supervisor

MODERATOR: ROY BONGIOVANNI, PD Staff Geologists

9:30 - 10:00

APMs for SMART COMPELTIONS

CASEY KAVANAUGH, Petroleum Engineer, District Field Operations

10:00 - 10:30

DOWNHOLE COMMINGLING

PAUL EVANS, Petroleum Engineer, Resource Conservation Section

10:30 - 10:45

BREAK

10:45 - 11:15

PREMATURE ABANDONMENT

ANDREW CAMBUS, Petroleum Engineer, Development Unit

11:15 - 11:45

GAS CAPS

YVETTE TABLADA, Petroleum Engineer, Resource Conservation Section

11:45 - 12:00

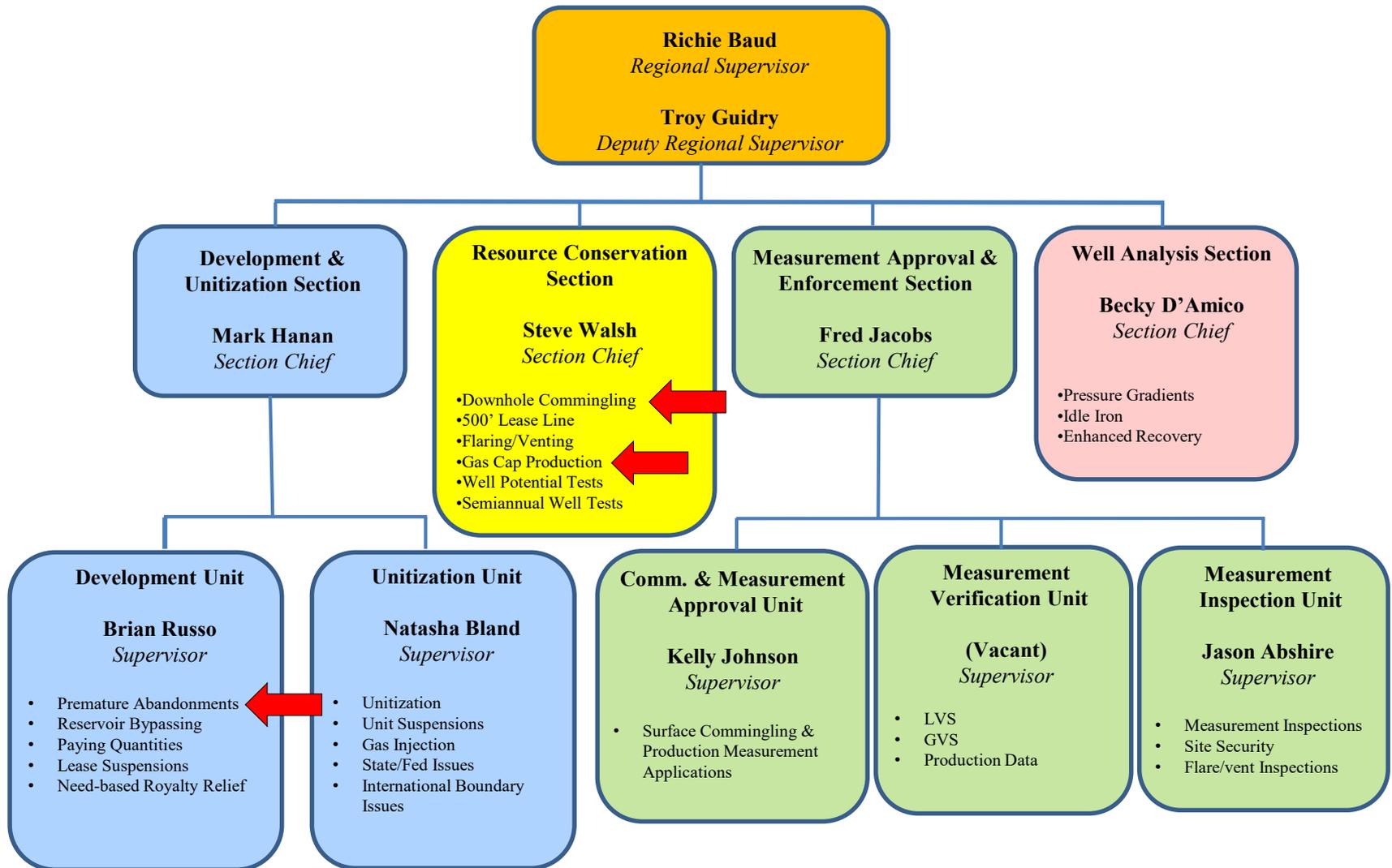
QUESTIONS & ANSWERS

Welcome

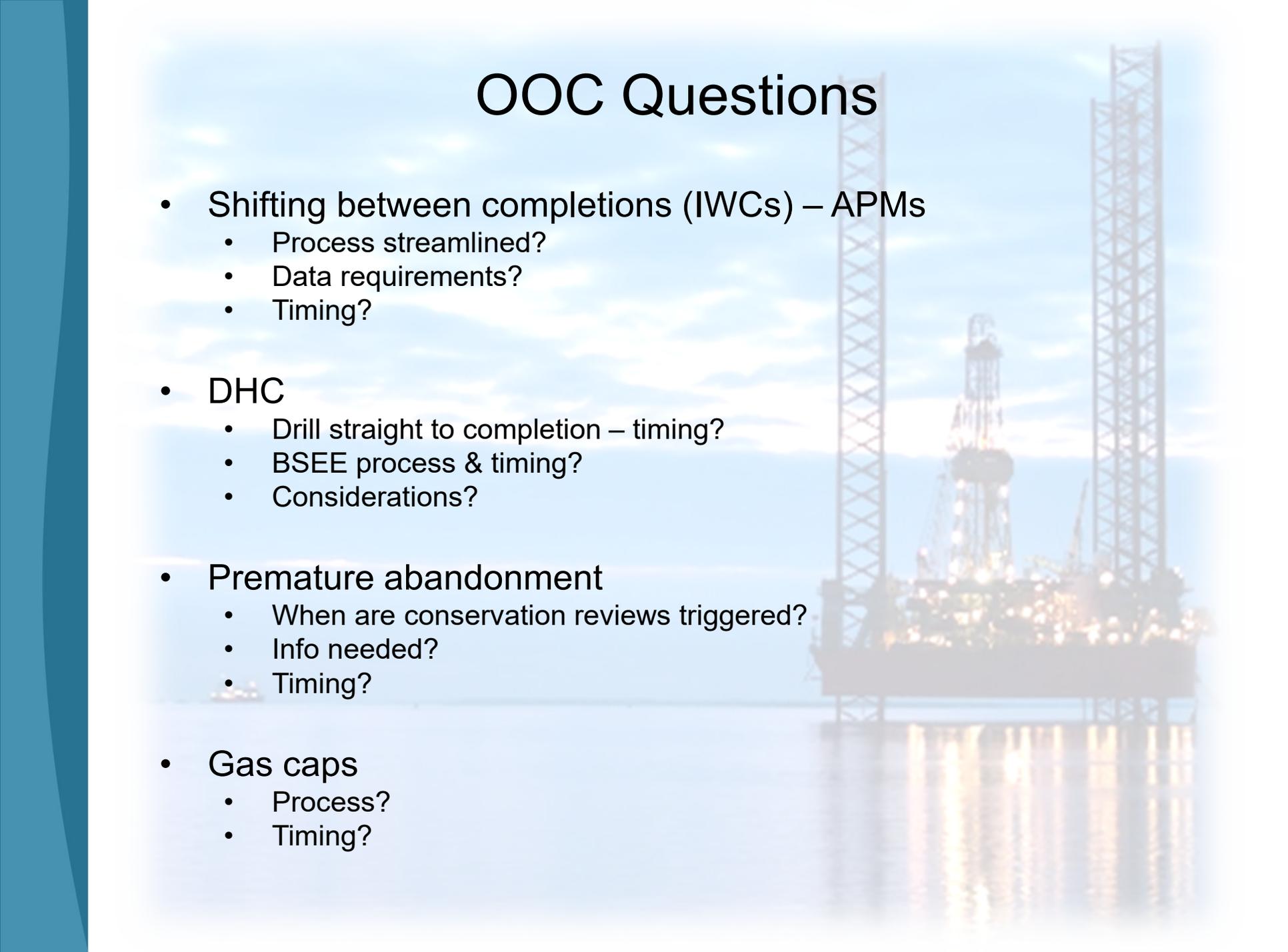
- Safety moment
- Restrooms
- Format
 - 4 topics
 - 1 BSEE presenter for each
- Questions
 - BSEE Supervisors available
 - During/after each presentation
 - Any remaining questions at end



Office of Production and Development



OOC Questions

The background of the slide features a photograph of an offshore oil rig. The rig is illuminated with warm lights, and its reflection is visible in the calm water below. The sky is a mix of blue and orange, suggesting a sunset or sunrise. The rig's structure, including its derrick and various platforms, is silhouetted against the bright sky.

- Shifting between completions (IWCs) – APMs
 - Process streamlined?
 - Data requirements?
 - Timing?
- DHC
 - Drill straight to completion – timing?
 - BSEE process & timing?
 - Considerations?
- Premature abandonment
 - When are conservation reviews triggered?
 - Info needed?
 - Timing?
- Gas caps
 - Process?
 - Timing?

BSEE & Operator Responsibilities

- Maximize ultimate recovery of economic developments
- Prevent damage to or waste of natural resources
- Protect correlative rights, including federal royalty interests
- Promote orderly exploration, development & production
- Expedite exploration & development
- Balance orderly energy resource development with environmental protection
- Ensure public receives fair & equitable return on OCS resources
- Safety

Applications

- Submit applications timely
 - Applications usually processed in order received
 - How long did it take you to perform G&G and engineering evaluations?
- Include required data
 - Table at 30 CFR 250.1167
- Demonstrate proposal satisfies regulations (e.g., maximizes ultimate recovery)

Note – PD requests are often for exceptions to normal practices

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Bureau of Safety and Environmental Enforcement

BSEE Seminar: Offshore Oil and Gas Production and Development Permitting Issues

Permitting Guidelines for Smart Wells
Casey Kavanaugh
Petroleum Engineer
GOMR District Field Operations Support

“To promote safety, protect the environment and conserve resources offshore through vigorous regulatory oversight and enforcement.”

Permitting Guidelines for Smart Wells

General Guidance

When an operator proposes to isolate productive zones in a wellbore through the shifting of sliding sleeves remotely, BSEE requires:

- Application of Permit to Modify (APM)
- Weekly Activity Report (WAR)
- End of Operations Report (EOR)

(30 C.F.R. § 250.505, 30 C.F.R. § 250.513, 30 C.F.R. § 250.605 & 30 C.F.R. §250.613)

Permitting Guidelines for Smart Wells

Three Scenarios

- **Sleeve Shifts within an Approved Commingled Zone**
- **Sleeve Shifts not within an Approved Commingled Zone**
- **Shifting Sleeves during Initial Completion Operations**
 - Cleanup/Flowback to Rig
 - Flowback to Platform

Permitting Guidelines for Smart Wells

Sleeve Shifts within an Approved Commingled Zone

- Operators may shift sleeves between zones approved for downhole commingling (DHC) to cycle valves and/or test individual productive zone(s) without an APM as long as:
 - The operator is returning all sleeves to their original position, and
 - The current BSEE-approved completion is the commingled sand.

Completion 2 of 5				
Type	Number	Reservoir Name	Producing Sand(s)	Completion Status Code
S	2	█ Sand / █ Sand	█ Sand █ / █ Sand █	PRODUCING OIL WELL
Completion Date	Squeezed Date	H2S Present	H2S Concentration (PPM)	Injection
01/14/2018	█	No		No
Producing Zone Location				
Lease	Area/Block	Latitude	Longitude	Datum (NAD27 or 83)
█	█	█	█	NAD27
Tubing Specifications and Remarks				
Size	Weight	Grade	Tubing Remarks	
4.500	15.50	13CSr-110		
Perforated Intervals				
Top (MD)	Bottom (MD)	Top (TVD)	Bottom (TVD)	
16747	16787	16747	16787	
17343	17399	17343	17399	

Note: For this scenario, the operator is subject to the conditions set within the DHC approval letter which either (a) voids the DHC approval if the well is produced in a “non-commingled” state for more than 90 days, or (b) requires approval from the Office of Production and Development in order to deviate from the approved DHC configuration for more than 90 days.

Permitting Guidelines for Smart Wells

Sleeve Shifts within an Approved Commingled Zone (cont.)

- If at any time you do not return to the starting configuration and/or the DHC approval becomes invalid, an APM, WAR and EOR must be submitted to capture the completion configuration.

Completion 1 of 5				
Type	Number	Reservoir Name	Producing Sand(s)	Completion Status Code
S	2	█ Sand, █ Sand	█ Sand █	PRODUCING OIL WELL
Completion Date	Squeezed Date	H2S Present	H2S Concentration (PPM)	Injection
09/05/2018		No		No
Producing Zone Location				
Lease	Area/Block	Latitude	Longitude	Datum (NAD27 or 83)
█	█	█	█	NAD27
Tubing Specifications and Remarks				
Size	Weight	Grade	Tubing Remarks	
4.500	15.50	13CSr-110		
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01/14/2018	09/05/2018	No		No
Producing Zone Location				
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█	█	█	█	NAD27
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Perforated Intervals				
Top (MD)	Bottom (MD)	Top (TVD)	Bottom (TVD)	
16747	16787	16747	16787	
17343	17399	17343	17399	

Permitting Guidelines for Smart Wells

Sleeve Shifts not within an Approved Commingled Zone

- Operators may never “temporarily” or permanently shift sleeves to isolate a productive zone(s) in order to test the production rate of another zone(s) or perform other operations without APM approval.
 - Allowing an operator to test the production rate of multiple zones within one APM is not allowed.
- For a “temporary” shift sleeve operation,
 - The APM must cover the isolation of the current zone, the temporary opening of the zone that is being tested, through the testing of that zone and end with the opening of the original producing completion.
 - The WARs should capture the sleeve shift through and upto the completion of the permitted operation. The WARs must capture daily production data (oil, gas & water) of the tested zone.
 - An EOR is not required, and therefore must be requested to be deleted, when all sleeves are returned to their original position.

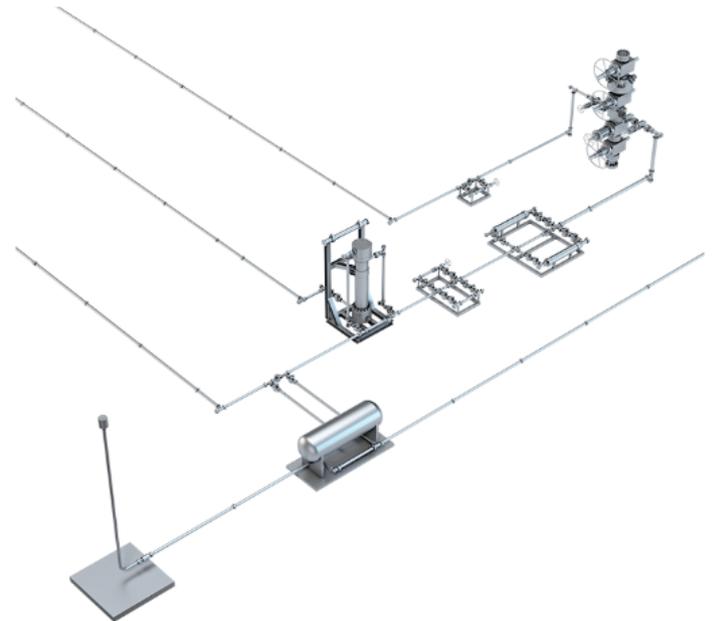
Note: In the event that the sleeves will not be able to return to the original producing completion configuration, a RPM must be submitted to document the present completion configuration and the reason why the permitted operation could not return to the original configuration. An EOR is required to capture the productive completion configuration at the end of the permitted operation.

Permitting Guidelines for Smart Wells

Sleeve Shifts During Initial Completion Operations

Opening and closing sliding sleeves multiple times during the cleanup/flowback phase of a permitted initial completion operation is allowed. Upon completion of this operation, the well will come online with one or more of those zones open to flow.

Note: *The simultaneous flow of multiple zones requires approval, even during initial completion operations.*



Sleeve Shifts During Initial Completion Operations

Cleanup/Flowback to Rig

- Only one APM is required for this operation.
 - The APM should capture the initial completion operation including the flowback procedure through the demobilization of the rig.
- The WARs should capture all sleeve shifts through and upto the completion of the operation when the operator selects the zone(s) from which the well will begin production.
 - The WARs must capture daily production data (oil, gas & water) of the tested zone(s).
- One EOR is required for this operation. The EOR should capture only the zone(s) the well will begin production from at the end of the initial completion operation.

Sleeve Shifts During Initial Completion Operations

Flowback to Platform

Two APMs are required for this operation.

- The first APM must capture the initial completion operation through the demobilization of the rig as discussed in the previous slide.
- The second APM should capture the entire flowback operation to the platform up to the completion of the operation when the operator selects the zone(s) from which the well will begin production.
 - The flowback should not last longer than 14 days per zone. The 14-day time interval begins the day the zone is opened for testing.
 - If the flowback is intended to last longer, approval must be obtained from the BSEE Development Unit (Office of Production and Development) prior to APM being approved.

Sleeve Shifts During Initial Completion Operations

Flowback to Platform (cont.)

There will be two sets of WARs.

- The first set of WARs should capture the initial completion operation up to the demobilization of the rig as discussed in previous slide of this presentation.
- The second set of WARs should capture from the start of the flowback operation up to the completion of the operation when the operator selects the zone(s) from which the well will begin production.
 - The WARs must capture daily production data (oil, gas & water) of the tested zone(s).

Two EORs are required for this operation.

- The first EOR should capture the zone(s) the operator intends to begin production from at the end of the platform flowback operation. The completion code should be a shut-in code.
- The second EOR should capture only the zone(s) the well will begin production from at the end of the platform flowback operation.



Questions?

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QUESTIONS & ANSWERS



Bureau of Safety and Environmental Enforcement

BSEE Seminar: Offshore Oil and Gas Production and Development Permitting Issues

Down Hole Commingling
Paul Evans
Petroleum Engineer
GOMR Production and Development
Resource Conservation Section

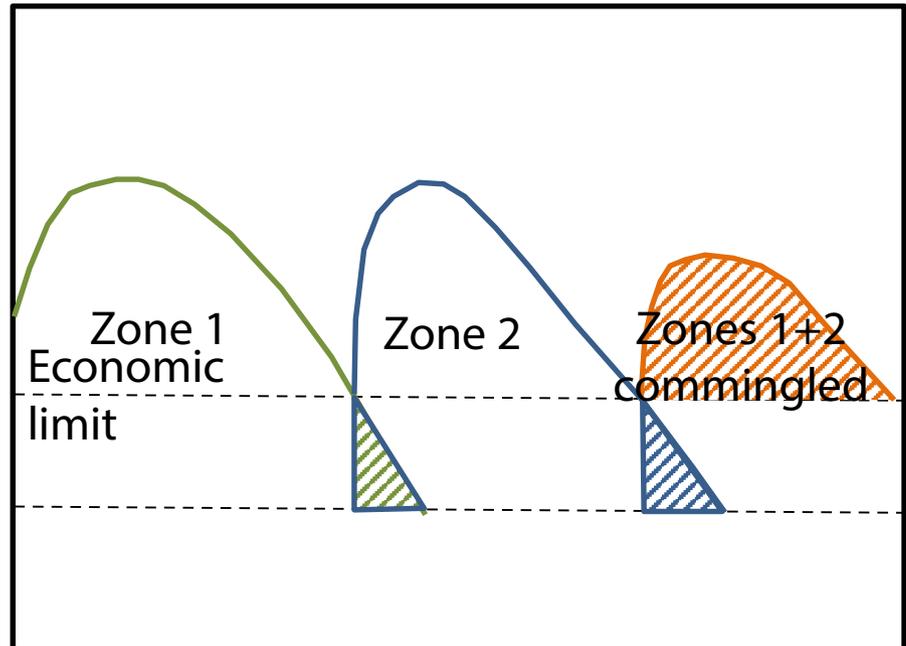
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Down Hole Commingling (DHC) Regulations

Regulation	Information
30 CFR 250.1158	How do I receive approval to DHC hydrocarbons
30 CFR 250.1167	What information must I submit
30 CFR 250.125	Service fees
30 CFR 250.126	Electronic payment instructions

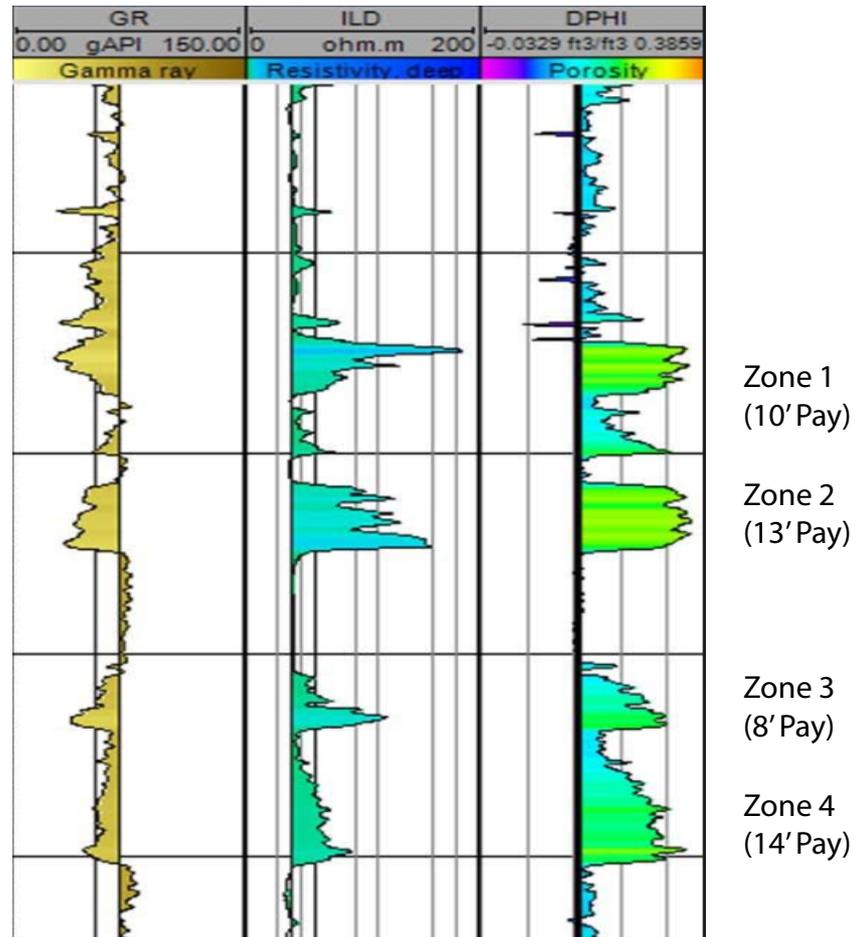
Reasons for DHC

Producing uneconomic reserves by increasing flow rate



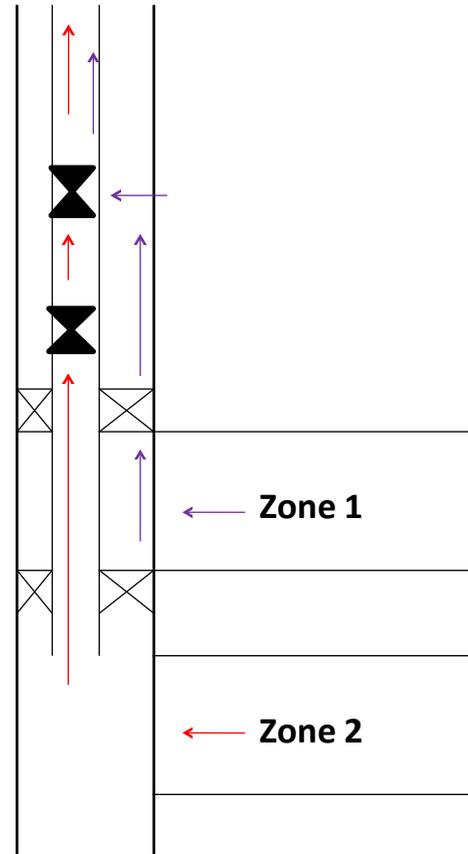
DHC Reasons Cont.

Produce
uneconomic
zones



DHC with Smart Technology

Using
Smart
technology



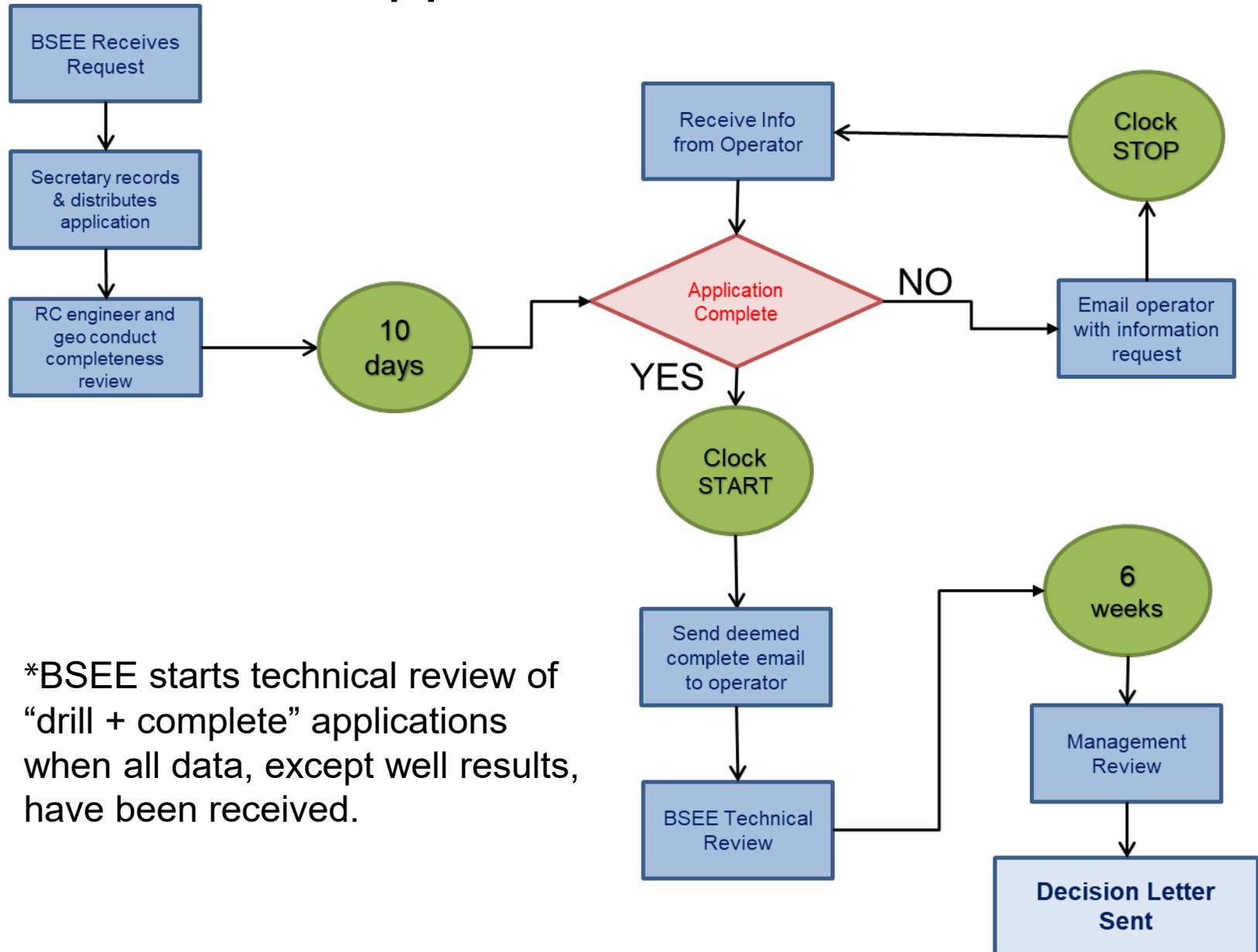
DHC Issues Encountered

- Failure of smart technology
- Water production
- Zone productivity differences
- Early abandonment

Revised DHC Process

- New letter terminology
- Include conditions of approval
 - Cycle valves
 - Individually test zones

Application Process



*BSEE starts technical review of “drill + complete” applications when all data, except well results, have been received.

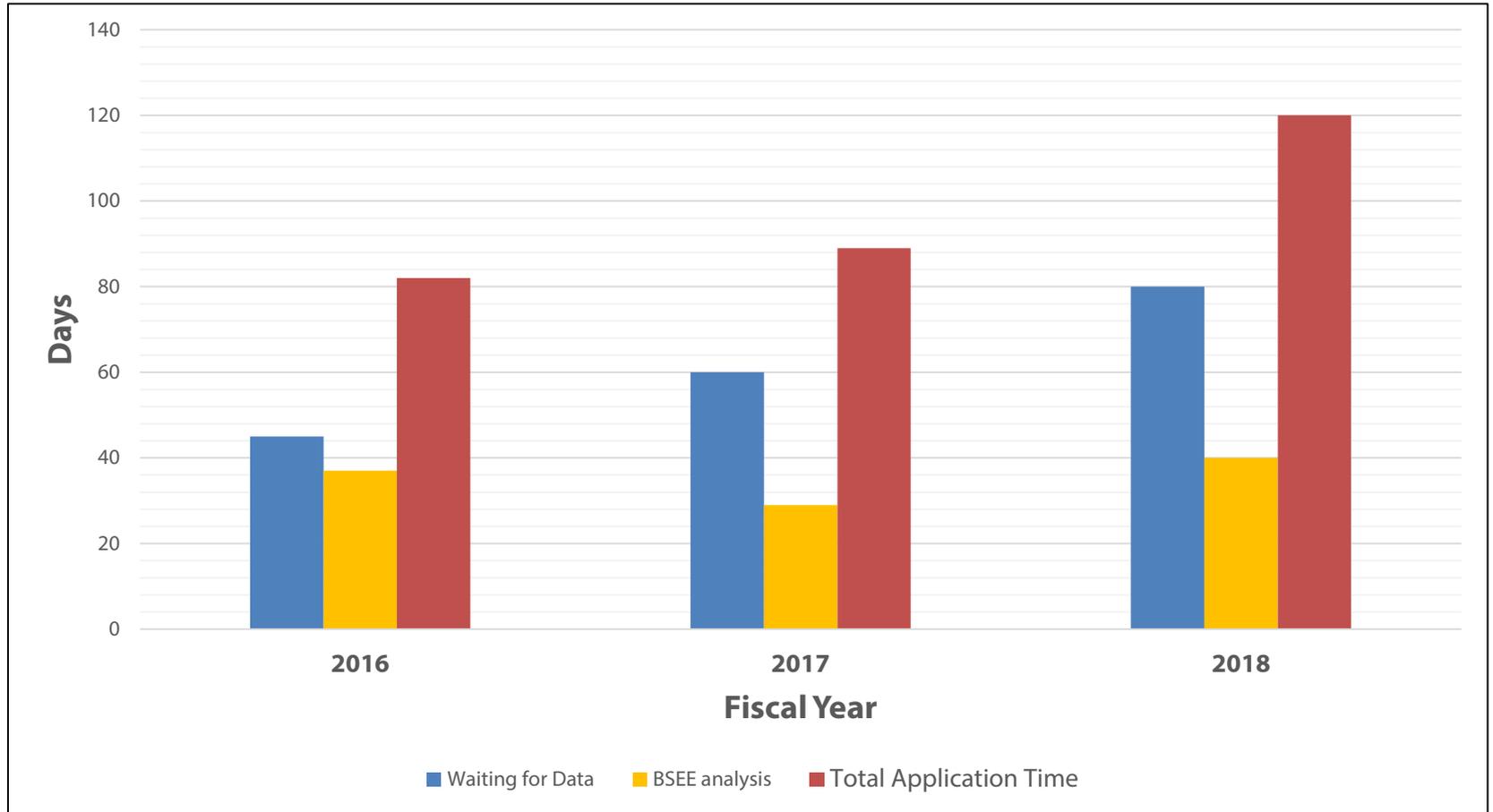
Key Considerations

- Pressures
- Isolation capabilities
- Commingled vs. sequential EUR
- Hydrocarbon properties
- Drive mechanisms
- Rock properties

97% Approved or withdrawn (2018)

3% Denied (2018)

DHC Historic Timelines



Incomplete Applications

Top Reasons:

- Missing pressure data
- Missing logs (wells not drilled)
- Maps without annotations

Recommendations

- Submit: two or more months in advance
- Drill & complete: submit pre-drill
- Unsure? Submit an application
- No API? Use 000s for pay.gov
- **Earlier is better, ALWAYS**



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Premature Zone Abandonment Program

Andrew Cambus

Petroleum Engineer

GOMR Production and Development

Development Unit

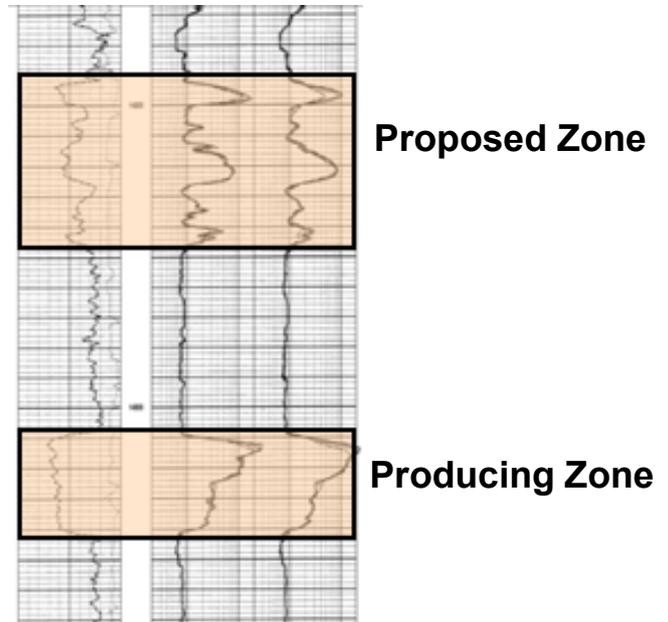
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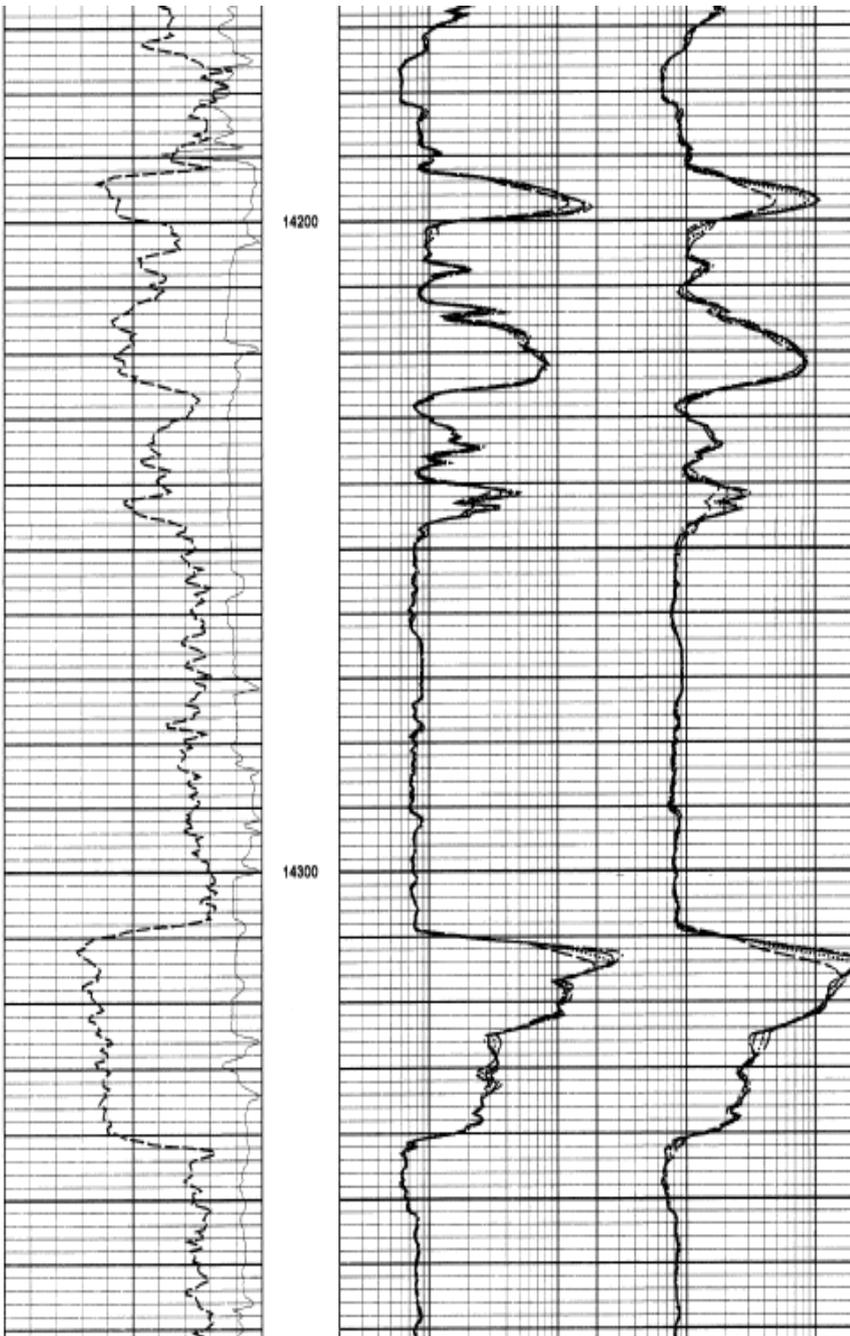
Premature Zone Abandonment Overview

- Operators request to abandon a producing zone to recomplete to a new zone
 - 30.CFR.250.1712(a): Must provide “substantiating information demonstrating its lack of capacity for further profitable production...”
- PD & District offices work together-District refers an APM to PD if:
 - average rates for last 3 months of production exceed 300 MCFD or 50 BOPD,
 - NTL 2003-G02
 - 3 Month Production Rate = $\frac{\text{Completion 3 Month Production Total}}{\text{Completion 3 Month Days Produced Total}}$
- Development Unit reviews to ensure economic zones are not:
 - prematurely abandoned
 - bypassed
- Development Unit calculates remaining reserves & evaluates economics
- If still economic, Development Unit recommends denial of APM

Supporting Information

- Recent well test data
- Latest 12 months production data
- Pressure data
- Structure map showing present conditions
- Isopach map
- Uneconomic Cases
 - 12 month profit/loss statement
 - 12 month allocated OPEX
 - Economic model





Zone 2

(Proposed Recomplete)

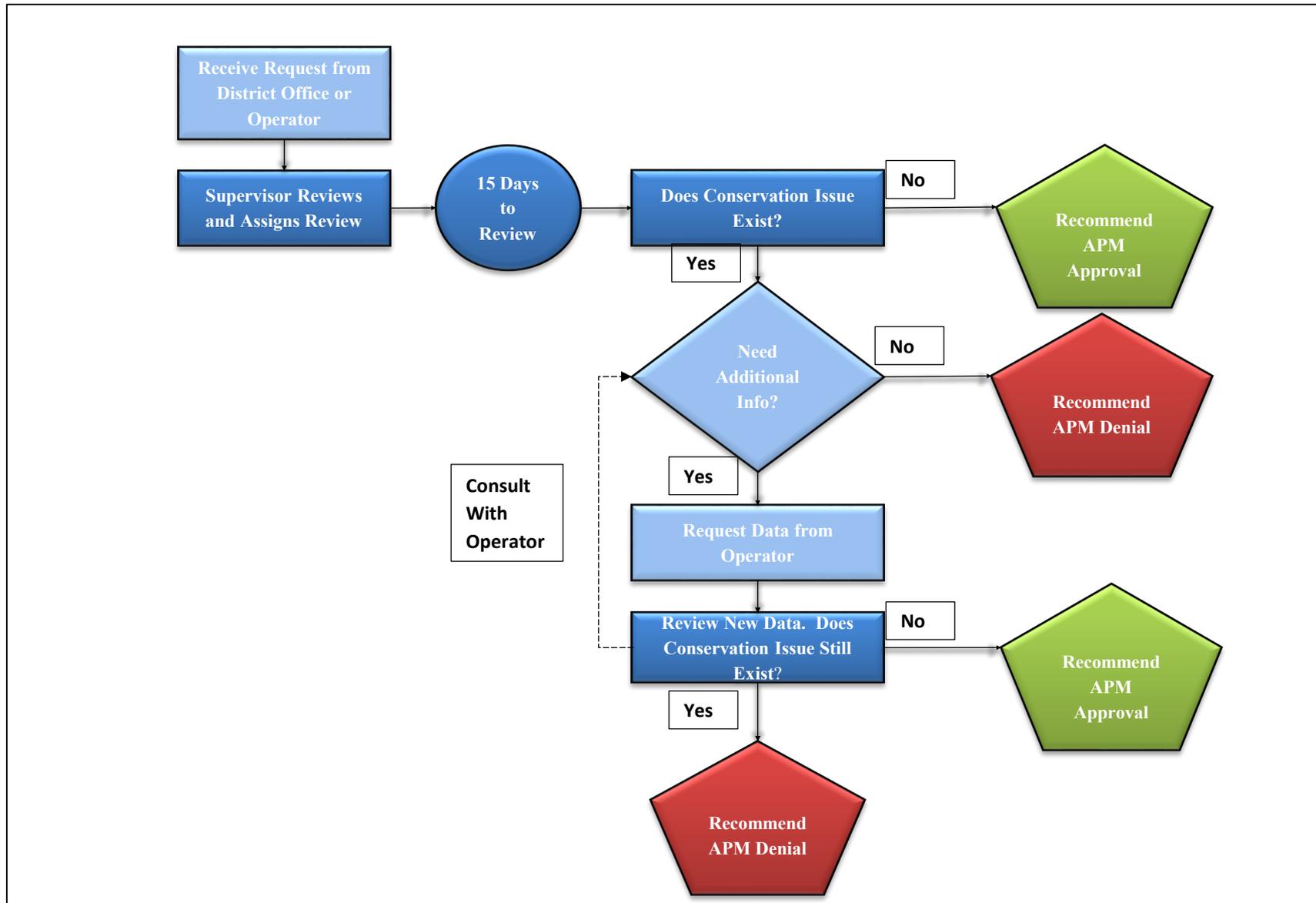
Initial Rate Estimated		
350 BOPD	400 MCFD	0 BWPD

Zone 1

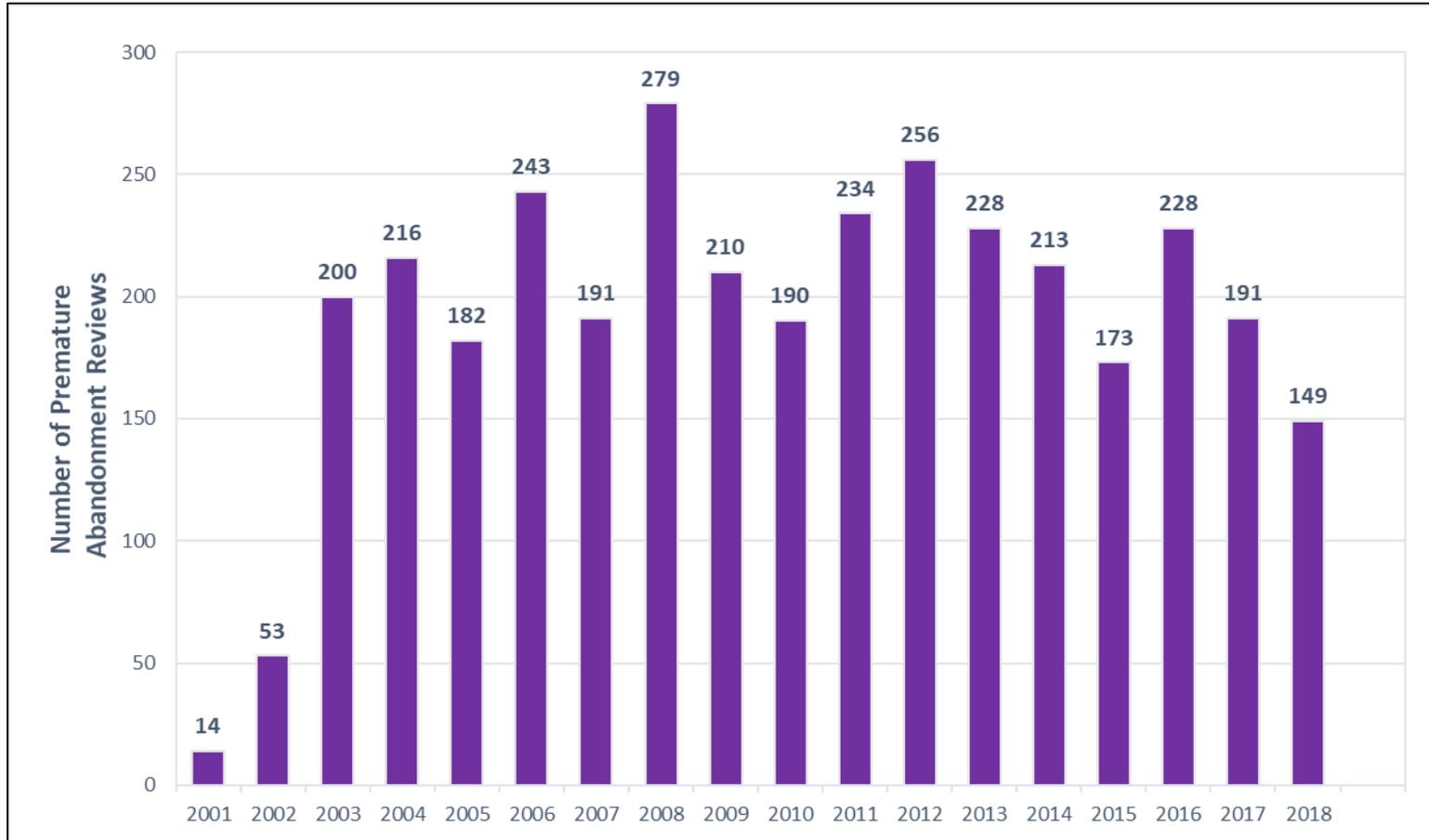
(Proposed Abandonment)

Initial Rate		
430 BOPD	500 MCFD	0 BWPD
Final Rate		
32 BOPD	40 MCFD	300 BWPD

Application Process

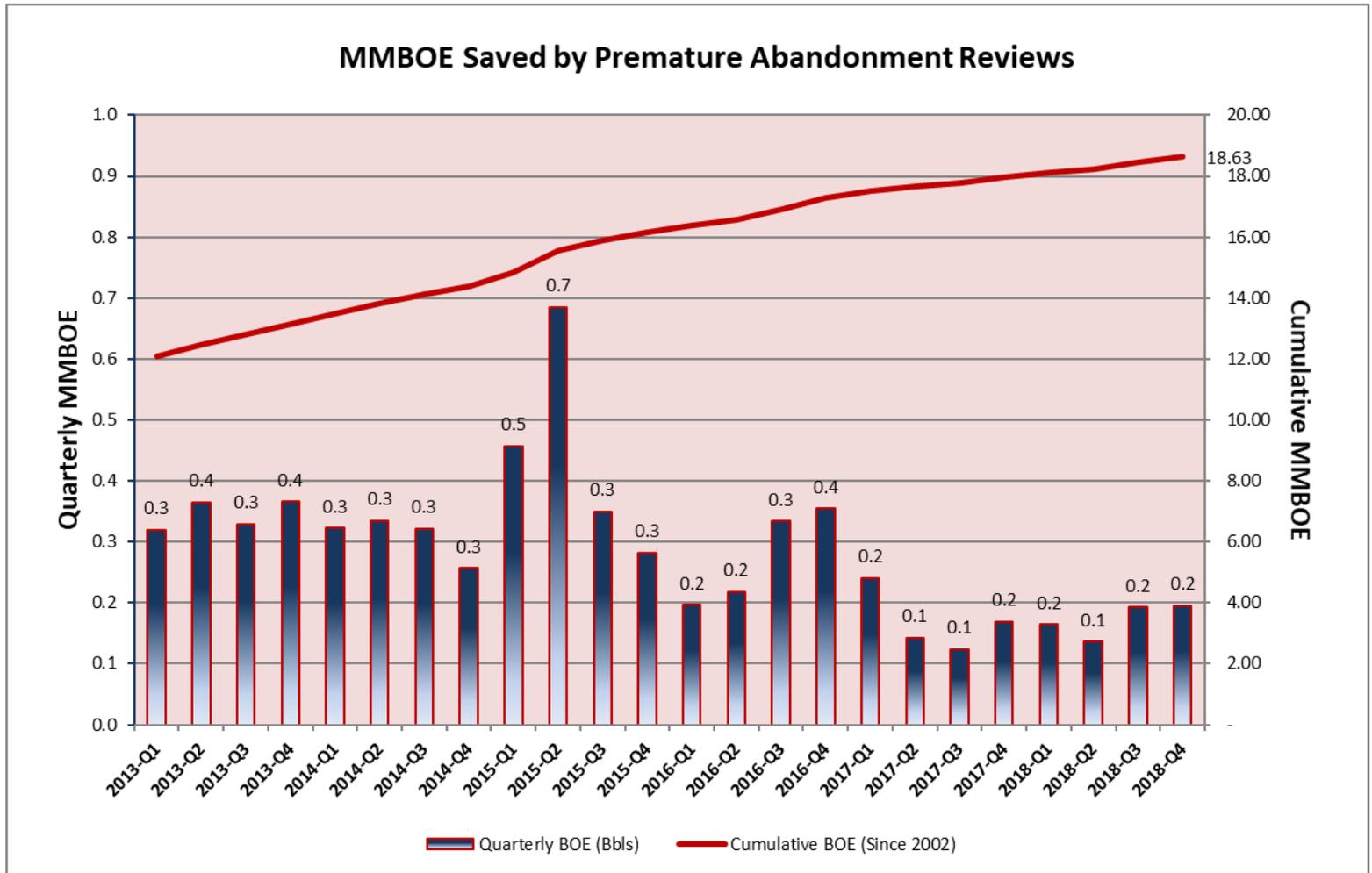


Premature Zone Abandonments



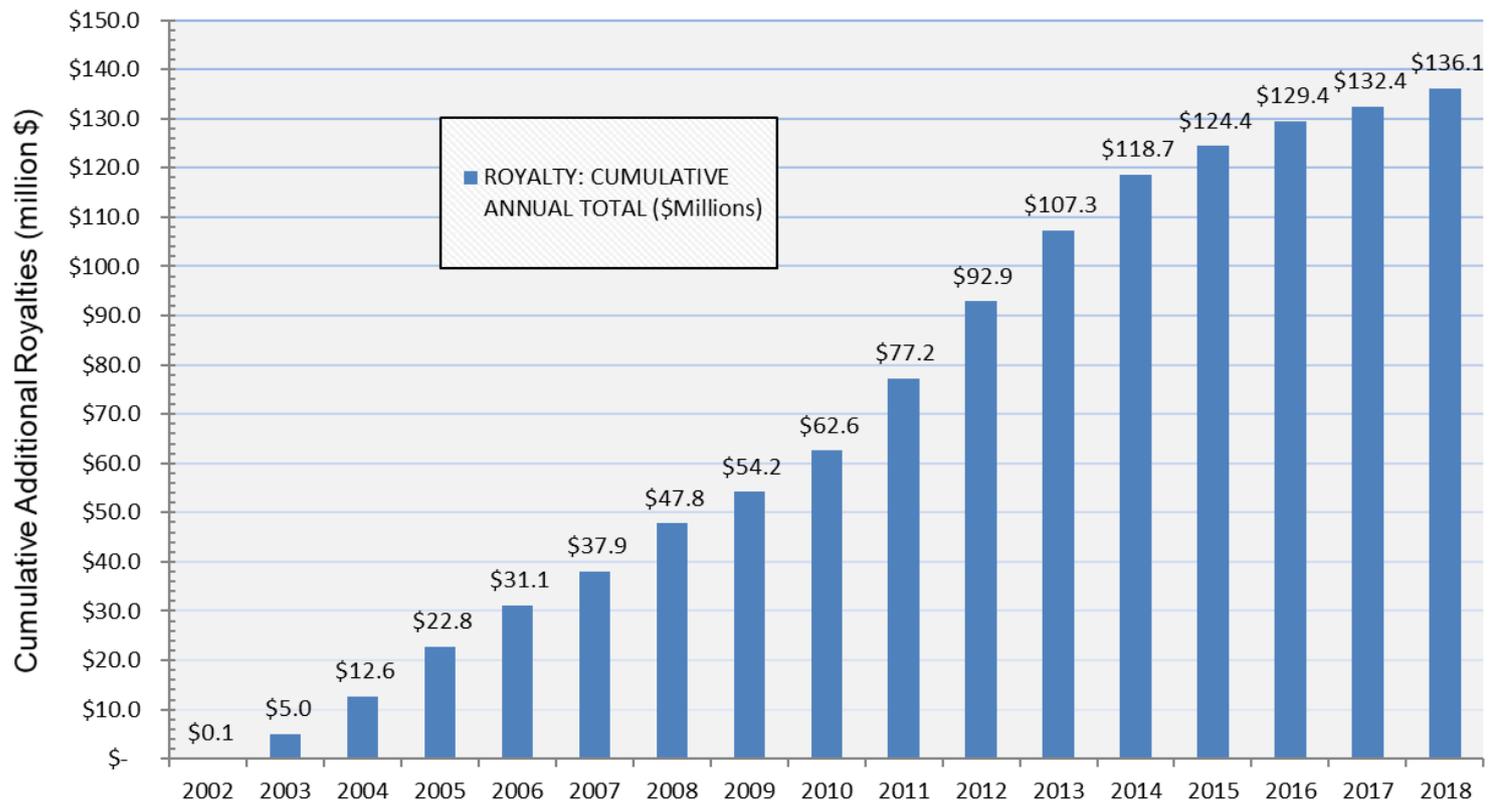
~25% reviews > 1000' WD and trending up to more complex deepwater environment

Impact of Premature Zone Abandonment Denials



Impact of Premature Zone Abandonment Denials

DENIED CONSERVATION REVIEW PRODUCTION ROYALTIES



Actual Production – Not estimated

Well Tests

- Require PD review
- Maximum time allowed is 14 days
- Must be in the best interest of the tax payer
 - Maximizes ultimate recovery
- Completion history
- Contingencies of approval
 - 1) Notify PD when test starts and ends
 - 2) Provide data and analysis from test to PD
 - 3) Must return well to original downhole configuration or shut-in well and seek permit approval

Premature Abandonments Enforcement

- Reinforce Regulations
- Prevent Waste
 - Ensure reservoirs produce until economically depleted
- Denial of APMs not in taxpayer's best interest
 - 96% Approved (2013-2018)
 - 4% Denied or Withdrawn (2013-2018)



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BSEE Seminar: Offshore Oil and Gas Production and Development Permitting Issues

Permitting Guidelines for Gas Cap Production
Yvette Tablada
Petroleum Engineer
GOMR Resource Conservation Section

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Gas Cap Production

Applicable regulation 30 CFR 250.1157

Approval required:

- Before producing gas-cap gas from a completion in an oil reservoir known to have associated gas cap
- Continue production when oil well begins to show characteristics of a gas well

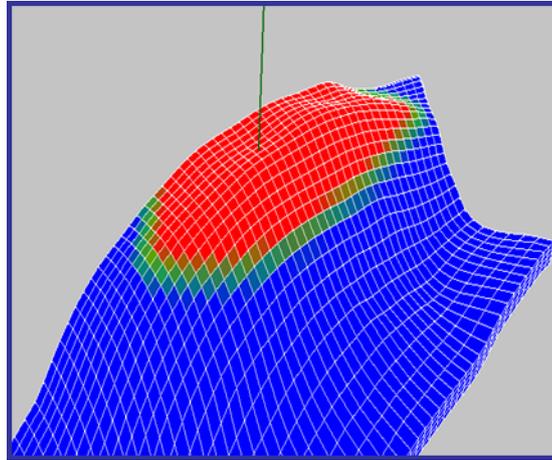
Required Information

- 30 CFR 250.1167 details requirements
- Maps
- Seismic data
- Logs
- Engineering data
- General info

Partial table from the regulation 

	WPT MMS- 126 (2 copies)	SRI MMS- 127 (2 copies)	Gas cap produc- tion	Downhole comming- ling	Reservoir reclassi- fication	Produc- tion within 500-ft of a unit or lease line
<p>§250.1166 What additional reporting is required for developments in the Alaska OCS Region?</p> <p>(a) For any development in the Alaska OCS Region, you must submit an annual reservoir management report to the Regional Supervisor. The report must contain information detailing the activities performed during the pre-</p>						
<p>§250.1167 What information must I submit with forms and for approvals?</p> <p>You must submit the supporting information listed in the following table with the forms identified in columns 1 and 2 and for the approvals required under this subpart identified in columns 3 through 6:</p>						
(a) Maps:						
(1) Base map with surface, bottomhole, and completion locations with respect to the unit or lease line and the orientation of representative seismic lines or cross-sections	√	√	√
(2) Structure maps with penetration point and subsea depth for each well penetrating the reservoirs, highlighting subject wells; reservoir boundaries; and original and current fluid levels	√	√	√	√	√	√
(3) Net sand isopach with total net sand penetrated for each well, identified at the penetration point	*	√	√
(4) Net hydrocarbon isopach with net feet of pay for each well, identified at the penetration point	*	√	√
(b) Seismic data:						
(1) Representative seismic lines, including strike and dip lines that confirm the structure; indicate polarity	√	√	√
(2) Amplitude extraction of seismic horizon, if applicable	√	√	√	√
(c) Logs:						
(1) Well log sections with tops and bottoms of the reservoir(s) and proposed or existing perforations	√	√	√	√	√	√
(2) Structural cross-sections showing the subject well and nearby wells	√	√	√	*
(d) Engineering data:						

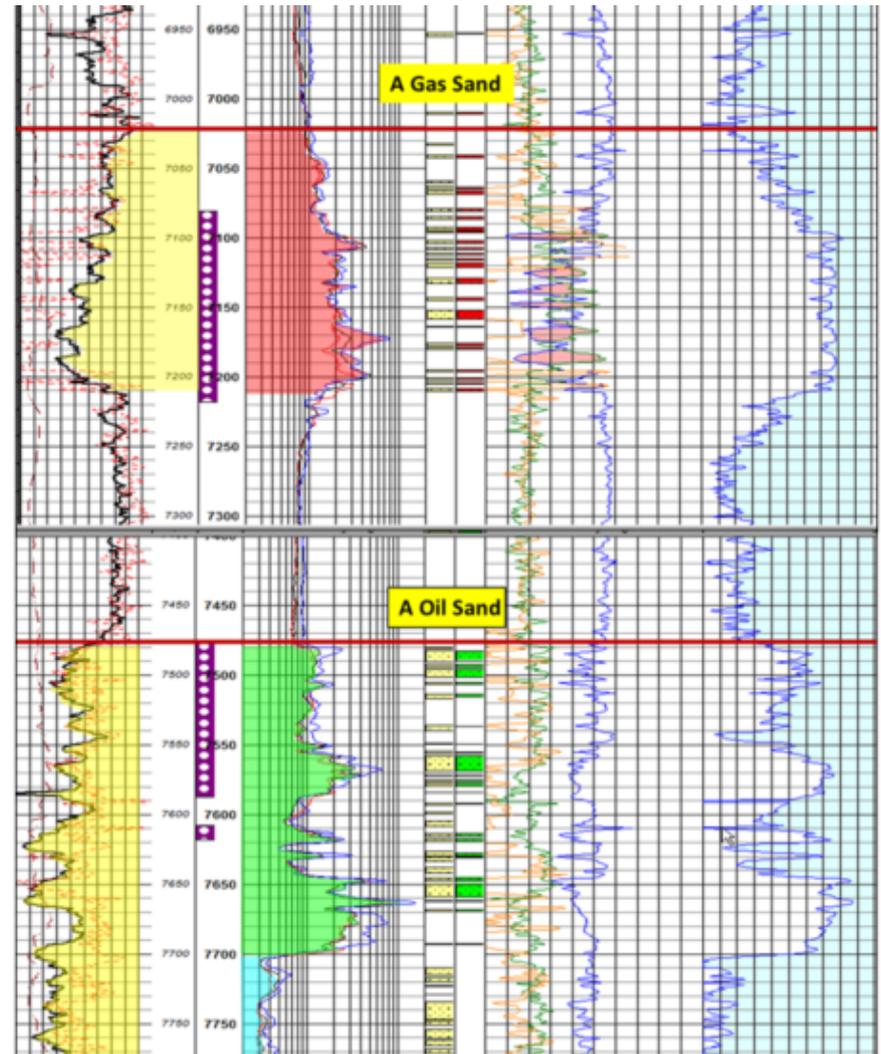
Gas Cap Production



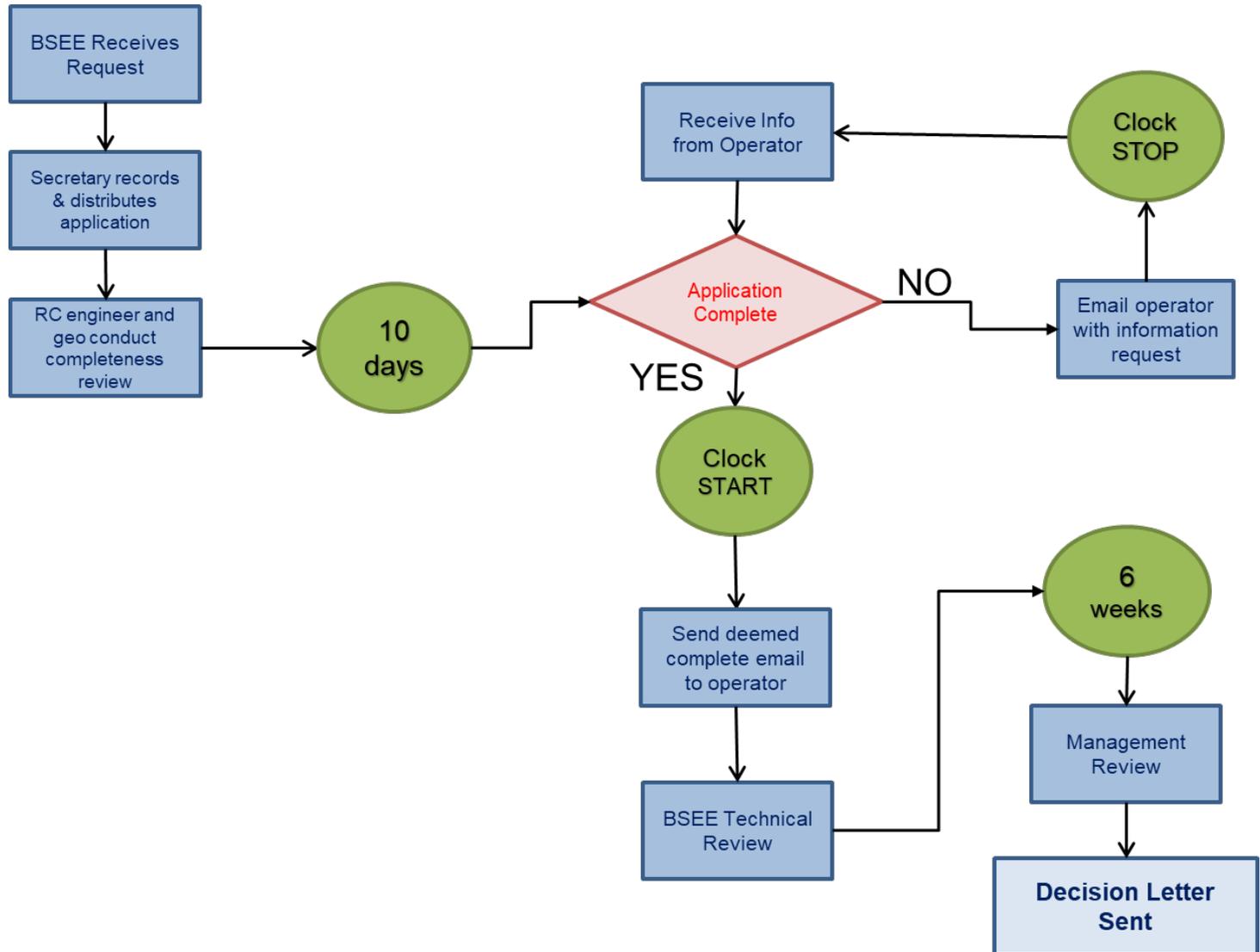
- Maximize ultimate recovery
- Economic development of reservoir
- Proper use of reservoir energy

Gas Cap & DHC

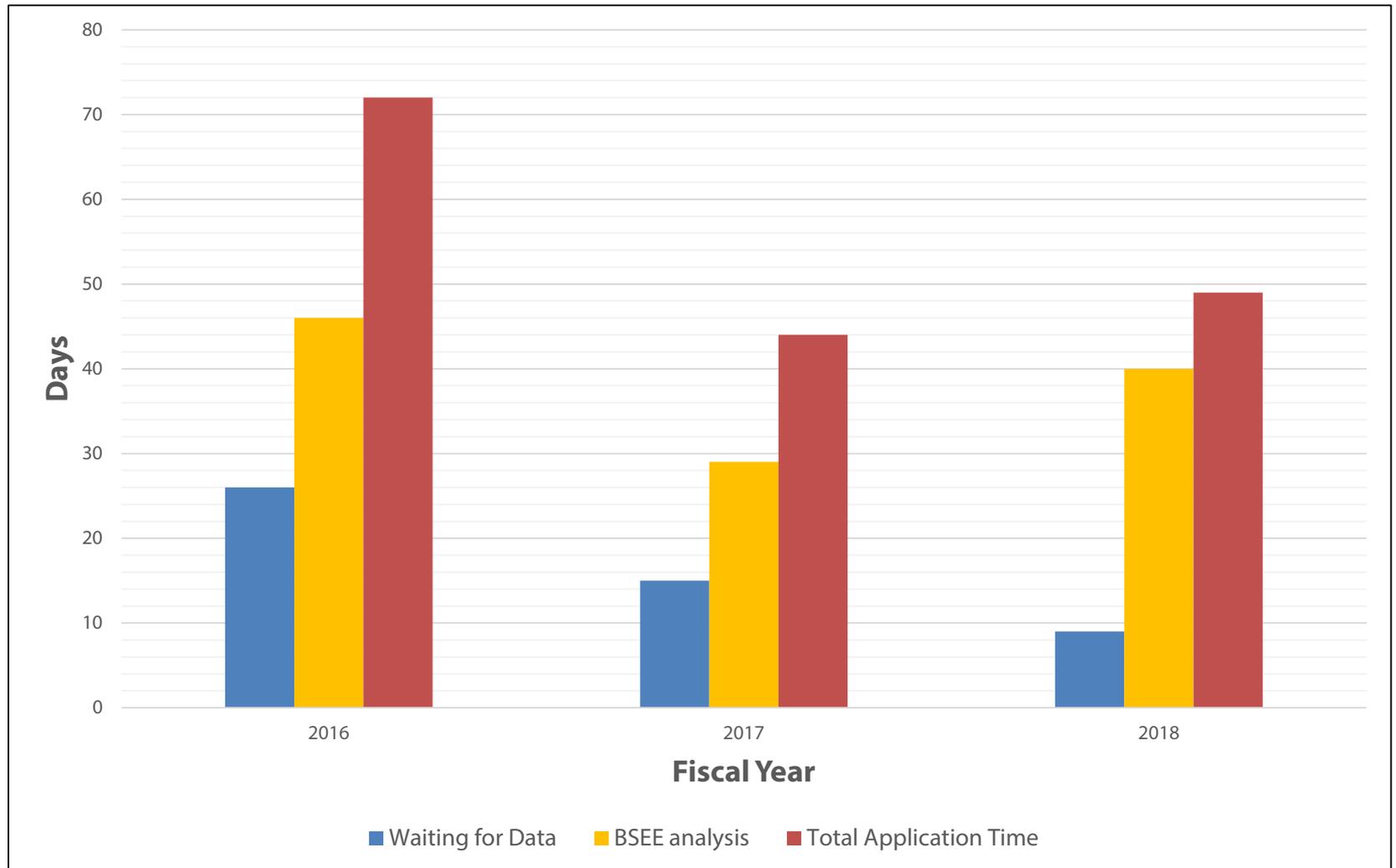
- BSEE approval is needed when a gas reservoir is commingled with an oil reservoir



Application Process



Historic Timelines: Gas Caps



Questions?



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